7.4) Static rigid bodies

Worked example	Your turn
A uniform rod AB of mass 20kg and length 5m rests with the end A on rough horizontal ground. The rod rests against a smooth peg C where $AC = 4$ m. The rod is in limiting equilibrium at an angle of $30°$ to the horizontal. Find: (a) the magnitude of the reaction of C (b) the coefficient of friction between the rod and the ground.	A uniform rod AB of mass 40kg and length 10m rests with the end A on rough horizontal ground. The rod rests against a smooth peg C where $AC = 8$ m. The rod is in limiting equilibrium at an angle of $15°$ to the horizontal. Find: (a) the magnitude of the reaction of C (b) the coefficient of friction between the rod and the ground. a) $240\ N$ (2 sf) b) 0.37 (2 sf)

Worked example	Your turn
A ladder AB, of mass m and length $5a$, has one end A resting on rough horizontal ground. The other end B rests against a smooth vertical wall. A load of mass $3m$ is fixed on the ladder at the point C, where $AC = 2a$. The ladder is modelled as a uniform rod in a vertical plane perpendicular to the wall and the load is modelled as a particle. The ladder rests in limiting equilibrium at an angle of $50°$ with the ground. Find the coefficient of friction between the ladder and the ground.	A ladder AB, of mass m and length $3a$, has one end A resting on rough horizontal ground. The other end B rests against a smooth vertical wall. A load of mass $2m$ is fixed on the ladder at the point C, where $AC = a$. The ladder is modelled as a uniform rod in a vertical plane perpendicular to the wall and the load is modelled as a particle. The ladder rests in limiting equilibrium at an angle of $60°$ with the ground. Find the coefficient of friction between the ladder and the ground. 0.23 (2 sf)